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The Transition to Market-Based Monetary Policy: What Can China Learn from the European Experience?

Jens Forssbæck and Lars Oxelheim

Research Institute of Industrial Economics
P.O. Box 55665
SE-102 15 Stockholm, Sweden
info@ifn.se
www.ifn.se

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Jens Forssbæck, Lund University, S-22007 Lund, Sweden, and Copenhagen Business School, DK-2000, Frederiksberg, Denmark

Lars Oxelheim[*], Lund University, S-22007 Lund, Sweden, and The Research Institute of Industrial Economics (IUI), S-11485 Stockholm, Sweden

[*] Corresponding author. Address for correspondence: Lund Institute of Economic Research, P.O. Box 7080, S-22007 Lund, Sweden. Tel: +46 46 222 8744; Fax: +46 46 222 44 37; e-mail: lars.oxelheim@fek.lu.se.

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Abstract

We discuss the prospects for Chinese money market development and transition to market-based monetary policy operations based on a comparative historical analysis of the present Chinese situation and the development in 11 European countries from 1979 up to the launch of European Economic and Monetary Union (EMU). Central banks in the latter group typically had an incentive to encourage the formation of efficient benchmark segments in the domestic money markets for the conduct of open market operations as traditional quantity-oriented instruments became increasingly ineffective. China is displaying many of the same symptoms as the European countries in the 1970s and 1980s, including poor monetary transmission due to excess liquidity and conflicts of interest due to unclear priority among multiple policy goals. We conclude that the current Chinese multiple-target monetary policy is counter-productive to efforts to develop an efficient money market that can serve as arena for an effective market-based monetary policy.

JEL classification: E42, E52, F41

Key Words: monetary policy operations, money market, China, European Union, deregulation

1. Introduction

The practical implementation, as well as the targets and the underlying objectives of monetary policy underwent significant changes in most industrial countries during a period from the late 1970s until the late 1990s. These changes were paralleled by a transformation of financial markets – including money markets as the main 'forum' for the implementation of monetary policy – consisting essentially of broad-based deregulation of credit systems on the one hand, and a rapid growth of alternatives to central-bank money as sources of financing on the other. The parallel processes of financial market development and reorientation of monetary policy are intertwined[1] and mutually reinforcing, and have their roots in domestic political-economy factors as well as in increased international financial integration. Hence, history seems to matter for the understanding of the development of financial market structures (Forssbæck and Oxelheim, 2003).

The weakness of the financial system is often argued to be an Achilles heel of the Chinese economy, and China is committed under its World Trade Organization (WTO) accession agreement to further opening up its financial system. This implies the removal of a large number of administrative restrictions, controls and regulations. Required reforms include opening up the capital account, liberalizing interest rates, and allowing foreign banks full access to the domestic market. There is a large (and growing) literature on the fragility of the Chinese banking sector, Chinese capital flows and capital flight, China's exchange rate regime, etc. However, the co-dependence between financial market development –specifically money market development – and increased effectiveness of monetary policy in the face of increased international integration - through a reorientation of the targets as well as the arsenal of instruments used by the central bank - is a less explored area of study. Because the money market is a key link between a country's financial system and its real economy, and the primary arena for the conduct of monetary policy, a poorly functioning money market is

presently a key problem in China, as the development toward a market economy in other sectors and commitments under the WTO accession agreement have taken the need for reforms of beyond the point of no return. We argue in this paper that remnants of a traditional 'dirigiste', direct-control approach presently thwarts the effectiveness of monetary policy, and that with a more open financial system these problems are likely to persist, or even accelerate.

We further argue that in several key respects - e.g. initial financial repression, increased capital mobility, poor transmission, and multiple targets with the exchange rate as the official one - relevant to this line of inquiry, the present situation in China is comparable to that of several European countries in the 1980s. Although potentially an economic giant, the size of the Chinese economy and its dependence on external markets during the 1990s and early 2000s make it more comparable with small and open, rather than with larger, developed economies.

The paper thus builds on research on money market development and monetary policy reform in a sample of small, open European countries[2] and extracts lessons for China of the experiences of these countries. Apart from the fact that they are small and open, the choice of comparison countries is motivated by the fact that the money markets for these countries' currencies were virtually non-existent at the beginning of the 1980s, but then went though phases of emergence, growth, sophistication and international integration over a period of approximately 20 years. The process is thus in some sense 'completed', rather than still ongoing, as in most other Asian countries (except Japan, which, however, is a special case for other reasons) or alternative benchmarks. The countries also represent the full spectrum with regard to the level of ambition of exchange-rate policy and 'reputation': from hard-currency, low-interest-rate countries to countries with a near-emerging-market status. We claim that due to this diversity, our eleven benchmark countries constitute an excellent 'laboratory' with regard to the link between money market development and the conduct of monetary policy.

The paper is organized as follows. In Section 2 we provide our view upon Chinese monetary policy in recent years. Section 3 describes the development of money markets in put benchmark countries and put China into that perspective. In Section 4 we address changes in central bank operation and the increasing role of open market operations (OMO). Section 5 extracts the main drivers behind these changes whereas in Section 6 we provide an empirical evaluation of the Chinese monetary policy in the light of the European experience. In Section 7, we discuss the Chinese monetary policy options in the light of the experience of our benchmark countries. Finally, Section 8 summarizes our findings in terms of policy recommendations for China based on the experience of these countries.

2. Chinese monetary policy in recent years – key pillars of the development

A brief summary of the People's Bank of China's (PBC) recent policies and performance runs as follows. After the abolition of the dual exchange rate system in the mid-1990s, a fixed exchange rate regime was adopted whereby the RMB was pegged to the USD. Four main objectives of macroeconomic policy were attached to the reorientation of policy: economic growth, price stability, full employment, and balance of payments equilibrium (Ping and Xiaopu, 2003). Current account convertibility was adopted in 1996, and restrictions on capital inflows were partially removed, whereas the enforcement by the State Administration of Foreign Exchange (SAFE) of remaining capital controls was strengthened (Ping and Xiaopu, 2003). Monetary policy was to some extent designed to support a more general policy to attract foreign direct investment (FDI) inflows (for an extensive analysis, see Prasad and Wei, 2005). In 1998−2001, the PBC made (largely unsuccessful) attempts to increase credit growth through open market operations and lowering of minimum reserve requirements. From 2003 onward, the attempts have rather been to tighten monetary policy, however with equally limited effects of the 'standard' arsenal of instruments. The PBC has frequently had to resort

to moral suasion and various forms of *ad hoc* administrative measures to steer banks' behavior in the desired direction (BIS, 2005; Green, 2005; PBC, various, Roach, 2004; van der Linden, 2005).

Steps have been taken toward further deregulating capital inflows, relaxing restrictions on capital outflows and expanding permissible foreign exchange transactions since the early 2000s. As a step toward gradually increasing the flexibility of the exchange rate (after intensive international debate – see, e.g., Eichengreen, 2005; Goldstein, 2004; Prasad et al., 2005; Yang et al., 2004), the US dollar peg was abandoned in July, 2005, the RMB revalued by 2.1% and henceforth linked to a currency basket through a managed float system.

There is increasing attention to the poor transmission of monetary policy in China (PBC, various; Ping, 2004). The problem is due to deficiencies both in the step between the central bank and the banking system, and between the banks and the public. Five such deficiencies can be identified: 1) The non-responsiveness of the banking system to the central bank's policy (in particular, their insensitiveness to interest-rate changes) is largely due to the excess supply of liquidity. If banks do not have to borrow in the money market to meet their liquidity needs, they do not care about the price at which money can be borrowed there. 2) As a consequence of banks' own insensitiveness to the pricing of money, they do not appropriately pass on variations in these prices to their customers; hence, central bank policy has a very limited effect on the consumption and investment behavior of firms and households. 3) Even if interest rate changes are passed on by banks on the margin, the effect is diluted, since the banks have limited ability and incentive to adequately price risk and differentiate the price of credit to different categories of borrowers accordingly (cf. governance problems within the banking sector below). 4) Borrowers are themselves insensitive to variations in the cost of funds because they do not face any consequences in the event of failure to service the debts (state-owned enterprises), and because credit-driven

consumption is still extremely limited (households). 5) The continuing habit of the PBC to exert control over the price, quantity, and direction of credit through informal measures ('window guidance', moral suasion) as a means to achieve policy objectives, and – more generally – the remaining political influence overlarge parts of the banking sector, distort the market mechanism in the bank loans market, leading to continuing mis-pricing and mis-allocation of credit.

3. General developments in domestic money markets in Europe as benchmarks

What political lessons can then be found from the creation of markets in Europe? The European benchmark countries this paper all followed the general trend among industrial countries of broad-based financial-sector deregulation in the 1980s and 1990s. Below, we make a brief summary of that process. [3] We then go on to describing major trends in financial innovation, differentiation, and market growth, with a focus on short-term securities markets (money markets). The findings are used for comparisons with the present state of affairs in China.

3.1. The point of departure - Stylized fact of the European situation 1980 and China today

The major *types* of regulations in force in a majority of European countries until the 1970s or, in most cases, the 1980s were pricing regulations (mostly various types of interest-rate regulations), a wide variety of quantitative credit and investment regulations, issuing controls on financial instruments, market-entry rules and ownership (asset) restrictions. The different types of regulation one by one are described below.

Interest-rate regulations were in force in all countries in the sample except the Netherlands at the start of the period covered here. Several countries pursued a low-interest-rate policy that, in combination with high inflation rates, led to very low (or even negative)

real-interest-rate levels. This, in turn, led to a high credit demand, indicating that credit had to be rationed and the market as a whole had to be regulated in detail, both as regards prices and quantities.

Quantitative credit and investment restrictions, in one form or another, were employed in a majority of our benchmark countries, both as a general monetary-policy instrument, as a tool to ration and control the allocation of credit, and to provide cheap financing for the government.

Issuing restrictions on securities were used to control the transfer of credit through direct channels (that is, through market issues). Usually, rules and regulations on minimum maturities, etc., were combined with various authorization requirements.

Market-entry rules or *line-of-business regulations*—the separation of banking and securities businesses, the separation of commercial banking from investment or savings banking, and other branching restrictions—limited the segmental integration within the financial system. A similar effect is implied by regulations limiting *ownership* linkages between different types of financial institutions, between financial institutions and other industry sectors, between domestic and foreign institutions, etc. In addition, and with strong resemblance with China, a sort of 'ownership restriction' was the dominance in some benchmark countries of state-owned banks at this period. This applied primarily to the countries with previously entirely nationalized financial sectors (Greece and Portugal), but also, to some extent and during some periods, in other countries. In Norway, for instance, indirect control by the government of the financial sector through ownership of major banks was one consequence of the banking crisis around 1990.

As can be seen from Table 1, which summarizes the situation around 1980 in terms of regulation in the benchmark countries, several of them applied all major types of regulations. Portugal, for instance, was in 1980 very much still marked by the effects of the nationalization

of the financial sector in 1974 and a system whereby the Banco de Portugal was equipped with almost limitless authority to intervene in all aspects of financial intermediation. All or most regulation types were also used, for instance, in Austria, Greece, Norway and Sweden.

As can also be seen from the table, the same holds true for China in the mid-2000s. In spite of steps toward deregulation, the financial system is still repressed and based on regulatory infractions in financial market activity.

INSERT TABLE 1

3.2. Deregulation and liberalization of financial sectors

In this sub-section we describe what happened in our European benchmark countries in terms of deregulation and liberalization during the 1980s and 1990s and what is currently happening in China..

Interest-rate controls began to be dismantled in the late 1970s in Austria, Denmark, Ireland, Norway and Sweden. By the mid-1980s, Denmark, Norway and Sweden (beside the Netherlands) had completely deregulated interest rates. Nor had Ireland by this time any formal interest-rate controls, but (retail) interest rates were loosely controlled through informal agreements between banks and the central bank until the mid-1990s. Interest-rate liberalization in these benchmark countries was completed with a lag to the very earliest deregulators (apart from the Netherlands primarily Germany, Canada, Australia and New Zealand), but with a lead to most of continental Europe, where the main steps were taken in the second half of the 1980s.

By 1990, also Austria,[4] Finland and Switzerland had completely liberalized interest rates; Belgium had, in principle, also deregulated interest rates, but retained some minor controls on specific categories or types of credit. The last among the benchmark countries to

abolish interest-rate regulations, Greece and Portugal, completed the process a few years into the 1990s, in accordance with their gradual implementation of European-Community directives. (See Rautava, 1994; Edey and Hviding, 1995.)

The general pattern in our benchmark countries was that the liberalization of wholesale interest rates occurred first, followed by lending rates and deposit rates. The process was mostly gradual, and sometimes hesitant on the part of the authorities. An illustration of this is that formal rules and restrictions (a ceiling, a quota, etc.) were often initially followed by recommendations or various types of agreements before being *de jure* liberalized. This was the case in Belgium, Denmark, Greece, Norway, Portugal, Sweden, as well as other countries (Austria and Ireland were mentioned previously). These 'implicit' interest rate regulations were enforced through the understanding that the authorities could, and would, enforce their goals by means of the reinstatement of formal regulations if deemed necessary (see, e.g., Grønvik, 1994).

In China, interbank interest rate ceilings were abolished in 1996, the central bank rediscount rate liberalized 2004, and the lending interest rate ceilings for banks were removed in 2004. The interest rate liberalization process is still ongoing, however, and administrative influence over price-setting is still exerted − both directly (as regards, e.g., deposit rates) and implicitly (Green, 2005; Liu, 2005).

As noted above, there is a clear co-dependence of various types of regulations. Thus, *quantitative regulations* to some extent became obsolete or irrelevant as interest rates were being liberalized. By that token, the quantitative regulation of financial intermediation was overhauled in Austria, Denmark, Finland, Ireland, the Netherlands, and Sweden in the first half of the 1980s. Belgium had begun doing so in 1979, but the process took more or less the entire 1980s to be completed. Of the other benchmark countries, Switzerland had not applied

quantitative controls since the 1970s. Norway abolished credit regulations in 1988, Portugal around 1990, and Greece a few years into the 1990s.

As regards quantitative regulations in China, credit quotas were formally abolished in 1998. However, the PBC still routinely controls the quantity of credit on a more discretionary basis (see, e.g., BIS, 2005).

In our benchmark countries, the regulation of debt securities issuance was mostly in place for slightly longer than interest-rate and credit controls. Exceptions are Denmark (which had a relatively free and internationally oriented bond market based on private debt already in the 1970s), and the Netherlands, where regulation was comparatively limited. Switzerland was low on formal regulation, but the growth of the domestic market segments was hampered by business practice, as well as by tax policy and other factors. Finland, Ireland, Sweden and Switzerland lifted issuing controls in the first half of the 1980s. In some countries important liberalization measures were implemented in the mid-1980s (for instance in Norway – see Norges Bank, *Penger & Kreditt*, 26:1, 1997). The Netherlands, although comparatively liberal in several respects, applied rules on minimum maturities, which constrained the development of short-term markets, and were fully abolished only in 1990.

In other benchmark countries, important steps toward the opening-up of securities markets occurred in the context of a reform of government-financing systems. Such is the case, for example, in Austria and Belgium (around 1990; see De Broeck *et al*, 1998), and Greece (early/mid-1990s, see Soumelis, 1995). Generally, however, the liberalization of markets for private debt was slower than other categories. For instance, the Portuguese fixed-income market was not formally opened to all domestic issuers until 1994 and to foreign issuers 1995 (see de Pinho, 2000). Also, as previously mentioned, market development was in some cases stifled by the existence of various types of more or less informal authorization

requirements. For instance, Switzerland abolished numerous cartel-like conventions and permanent securities-issuance syndicates of banks in 1990.

In China, securities issuance (both debt and equity) remains surrounded by formal and informal restrictions. Before the mid 1980s (the pre-reform period), the resource allocation was entirely in the hands of the central government; State Owned Enterprises (SOE) were financed over the government fiscal budget. The SOEs had in general no idea about the concept of cost of capital. The central government used state-owned commercial as fiscal agents. However, some local, unofficial and unregulated markets for equity shares (and bonds) began to develop spontaneously in the 1980s (Green, 2003). By the opening of stock exchanges in Shanghai and Shenzhen in December 1990 the Chinese government began to pay attention to the regulation and supervision of such markets. However, this attention ended up having the government in dual roles: majority owner of the bulk of listed shares and regulator at the same time. The government's characterization of the existing stock exchanges as 'controlled experiments' is illustratory of the general attitude of the authorities. The reform of SOEs was slow and liberalization of the financial sector was delayed as part of a cautious and gradualist approach adopted by the Chinese government. The overall goal for governments at all levels was social stability.

Things started to happen by the early 1990s when declining fiscal revenues and bad loans limited the government to meet SOEs financing needs. Formal central regulatory controls were introduced over the two stock exchanges combined with financial market liberalization and state bank reforms. Initially the stock exchanges were supervised by the local governments, but in 1992 the China Securities Regulatory Commission (CSRC) was established. A quota system was used to control the flow of initial public offerings (IPO); prior to December 1990 based on amount of shares and then based on the number of firms listed. The annual quota was set by the State Planning Commission. Stock market emerged as

a vehicle to facilitate the financing of SOEs. The SOEs had some autonomy but the ultimate control was delegated to local government.

A great leap forward towards a market economy in China was taken in 1994/95 with a set of measures ranging from the Government subjecting itself to stronger market discipline by denying itself the option to borrow from PBC for fiscal purposes, state-owned commercial banks' (SCB) role as agents of the state declined, the formal establishment and regulation of the interbank market (IM) for short term loans, exchange rate unification, an interbank foreign exchange market, three specialized policy banks; all paving the way for open market operations (OMO) by the PBC. The Asia financial crisis made the central government aware of the vulnerability of the Chinese financial system.

In 1998 four state-owned Asset Management Companies (AMC) were established to handle the accumulated huge volumes of non-performing loans (NPL). The clean up process started in 1999. This meant the start of a non-bond debt market in China, whereas the trade of government bonds on the interbank market was introduced already in August 1997. However, corporate bonds (CB) were issued already in the mid-1980s but in an unregulated framework. When a formal regulation was introduced in the early 1990s the primary CB market was reserved for a few selected SOEs and the market has since then remained small. Government bonds have dominated the Chinese debt market. In 2002, trade in government bonds amounted to 95% of all traded debt excluding NPLs (Bottelier, 2004).

The Chinese financial market is still a three-person-game. Central government, local government and listed firms are the players with local governments acting like "parents" of listed firm. In September 2006, an important piece of the market game emerged in the form of the opening of the Financial Futures Exchange.

In some of our benchmark countries - including Austria, Belgium, Denmark (where de-compartmentalization of the banking sector occurred already in 1975), Finland, Norway and

Sweden - various *market-entry regulations* (branching regulations, line-of-business restrictions, etc.) were partly or wholly abolished in the 1980s and early 1990s. Moreover, a 'spontaneous' functional market integration (taking place, for instance, through banks establishing subsidiaries within the securities-trading business, or purchasing finance companies) is often considered a major feature of the financial-market transformation process undergone by the industrial countries in the 1980s.[5] To some extent, this implies a diminishing practical importance of remaining regulations.

To this category may also be counted restrictions on foreign-bank entry. In the sample of benchmark countries, Finland, Norway, Portugal and Sweden were among those that opened their domestic markets for foreign banks during the 1980s. In some other countries, including the Netherlands and Switzerland, rules on foreign-bank access to the domestic market were already relatively liberal at the start of the 1980s, whereas in much of the rest of the continental-European benchmark countries, significant steps were taken only with the implementation of the EU's 2nd Banking Directive (effective in 1993).

In the area of ownership control, the deregulation wave made a comparatively modest impression in the 1980s and 1990s, and several such regulations remained in the mid-1990s (see, e.g. Herring and Litan, 1995). State-ownership of a large proportion of domestic financial institutions also outlived financial integration in some benchmark countries. The Greek banking sector, for instance, was still completely dominated by state-owned banks when ownership regulations were abolished. In terms of assets, the government's ownership share was about 75 percent (see Hope, 1993). In other benchmark countries, state-ownership of banks was an effect of crises in the banking systems, as noted above. The government's ownership share of banks in Norway and Finland were 52 and 35 percent, respectively, in the early 1990s.[6]

State-owned banks dominate the financial sector also in China. The four state-owned banks had a market-share of 57% in 2003. Local banks (20%), 10 joint stock commercial banks (14%), three policy banks (8%) and foreign banks (1%) constitute the rest of the Chinese banking sector (van der Linden, 2005). Institutional reforms of PBC and state-owned banks have been undertaken since 1993, however, initially largely unsuccessful, because they did not fundamentally alter incentive structures and remove soft budget constraints within the banking sector (see, e.g., Park and Sehrt, 2001). A five-year time-table for a gradual opening of the banking sector was announced in 2001, and reform thereafter has included the transfer of power over banking regulation and supervision from the PBC to the China Banking Regulation Commission (CBRC), financial restructuring of the largest state-owned banks (both through AMC and recapitalization directly over the government budget), and a full abolition of line-of-business, ownership and foreign-entry restrictions in the banking sector as a result of WTO negotiations (still ongoing; see Hope and Hu, 2006; Liu, 2005). In 2006, we have also witnessed the privatization of some of the largest state-owned banks.

To summarize, the deregulation of domestic financial sectors in the European benchmark countries began between the late 1970s (Austria, Scandinavian countries) and the mid-1980s (Greece, Ireland), and was completed mostly around 1990, or a few years into the 1990s. In China, liberalizations began in the mid-1990s. It is difficult to measure the level of repression, but based on the categories of restrictions still in *de facto* use in the mid-2000s, it would appear as though the process still has some way to go.

3.3. Money market growth and development

Table 2 summarizes starting years for some of the main money market segments in the European benchmark countries and in China. In the former, during the 1980s and 1990s a certain convergence in terms of the *presence* of different types of money-market instruments

occurred. Considerable dissimilarities remained, however, in terms of the relative total size of the domestic market as well as in terms of the *relative importance* of specific segments of the market (see Table 3).

INSERT TABLE 2

INSERT TABLE 3

The most traditional money-market segment is the interbank deposit market, whose importance is largely determined by the monetary authorities' choice of operative framework and by the existence of alternative segments. Deposit markets turned up in most countries as monetary-policy instruments changed during the 1980s and 1990s. In China, the CHIBOR interbank market was established in 1996 and opened to foreign banks in 1998.

In the short-term securities markets treasury bills or equivalent short-term government securities are typically the most important sub-market. In several benchmark countries (for example, Austria, Belgium, Ireland, Sweden), short-term government securities had existed for a long time before the 1980s, but were traditionally non-marketable, and sold directly to final holders at regulated rates. In none of the benchmark countries did true markets for t-bills turn up until after 1980. Years in Table 2 therefore refer to the appearance of *viable markets* for short-term government securities.

The Chinese t-bill market is so far insignificant. The aggregate supply of tradable bonds was in 2003 equivalent of about 32 percent of GDP. A low figure as compared with the average for developed markets which is about 100 percent. The maturity structure of bonds is such that less than 5% are 2-year or less, indicating a short-term (government) bill market of somewhere around 1% of GDP

Two other main cash-instrument types—commercial paper (CP, generally issued by non-bank entities) and certificates of deposit (CD, a securitized bank liability)—were

introduced in several benchmark countries in the mid-1980s, but as revealed by Table 3 their importance varies greatly. In some cases (for example Finland and Sweden), the introduction of CDs preceded the introduction of tradable government securities. In other cases, diversification of the market to other than government issues occurred several years after a t-bill market—in a true market sense—had been established (Ireland, the Netherlands, Portugal). A CD market does not exist in China beyond the PBC's own central bank bills, which were introduced in 2003. The development of this segment has been fast, however, with an increase of outstanding amounts to an estimated 7% of GDP in March 2005.

Commercial-paper markets emerged in far from all the benchmark countries. In many cases, the markets have also shrunk somewhat from their peaks in the early 1990s. There seems to be some indications that where commercial-paper markets could be benchmarked against a liquid government-bill market (or other instrument with a market-supporting role), their development came earlier and was more extensive (see Alworth and Borio, 1993). In China, the PBC announced rules for issuance of 'short-term financing bills' in late 2004 but no viable market exists by early-2006.

Beyond the above reported cash instruments, various derivative instruments play an important role, as do repurchase agreements (repos), which − according to BIS estimates − was the fastest growing instrument/transaction type internationally during the 1990s. Data, however, are scarce. Reporting in different countries is also such that available historical data are not readily comparable (for a survey of repo markets in G-10 countries, including data availability, see Bank for International Settlements, 1999). Existing data indicate considerable variations in derivatives as well as repo markets (see Forssbæck & Oxelheim, 2003). In some benchmark countries, repo markets were partly stifled due to thin debt markets (the Netherlands, Norway), ambiguities with regard to regulatory policies, legal status and tax treatment (Ireland, Portugal, Switzerland), or an excessively high degree of concentration of

market players (see Commission of the European Communities, 1999). A repo market was established in China in the early 1990s; since 1997, it is split up into an interbank market and a corporate market (hosted by the Shanghai Stock Exchange). Available evidence indicate that repo transactions in government bonds are by far the most important contract type traded interbank (PBC, various; Ping, 2005), but it is not clear to what extent these are transactions with the central bank; nor is it possible to directly compare the importance of this market with other central bank facilities for the settling of liquidity imbalances (see sections 3.2 and 5, below). A first set of rules to govern Chinese banks' derivatives trading was introduced in 2004, but a viable market does not yet exist (de Teran, 2004). However, as was previously mentioned, the establishment of the Financial Futures exchange in September 2006 may mean a essential step forward,

4. Changes in central-bank operations[7]

Until the mid-1980s central banks in our benchmark countries relied largely on traditional credit and deposit facilities (standing facilities), supported by various direct controls, for the conduct of monetary policy. The ordinary credit facilities were mostly supplemented by some sort of tranche-division system (for example, Denmark, Finland), penalty-rate system (Austria, Sweden), or a combination of both (Belgium, the Netherlands) in order to allow central-bank control of the marginal cost of banks' borrowing under the facilities, and thereby of the supply of liquidity to the banking system.

All our benchmark countries reformed their operative frameworks for monetary policy quite substantially during the 20 years we study. In some countries, the revision of the monetary-policy operating framework took the form of comprehensive reforms (for example, Denmark 1992, Switzerland 2000); in others, developments proceeded in a more piecemeal manner. In several countries (Belgium, Finland, the Netherlands) the trend toward a gradually

increased diversification of liquidity-supply instruments became visible toward the mid-to-late 1980s. Others followed suit during the 1990s (Denmark, Portugal, Austria).

4.1. The diminishing role of quantitative controls

The diversification of instruments used by central banks as well as by other money-market agents in our benchmark countries during the 1980s and 1990s was paralleled with the lifting of most direct regulations. This sub-section therefore focuses on one direct control that remained in use by many central banks—the minimum reserve requirement.

During the 1990s, practically all our becnhmark countries followed an international trend among industrial countries toward lowering or completely abolishing reserve requirements (see Table 4). The major arguments behind these reforms were to reduce the tax effect of reserve requirements and to neutralize the competitive disadvantage of subjected depository institutions vis-à-vis other financial institutions – domestic or foreign (see European Commission, 'Minimum Reserve Requirements and Monetary Policy', *Weekly Review of Financial Market Developments* 37, November, 1997).

INSERT TABLE 4

The objectives of the reserve-requirement instrument were originally to maintain banks' liquidity even in case of large deposit withdrawals, and to influence liquidity for monetary-policy purposes. Nowadays, reserve requirements mainly serve three purposes in developed economies. One is as a means of providing for banks' ongoing liquidity needs (having banks in a position of reliance on the central bank facilitates the conduct of monetary policy). A second purpose is to improve the flexibility of banks' liquidity management (reserves can be used to settle interbank payments). Finally, reserve requirements (particularly if

unremunerated) can provide seigniorage income for the central bank, thereby contributing to its profitability and (economic) independence (see, e.g. Grønvik, 1994; Bank of Finland Bulletin 12, 1996; BIS, 2003).

Benchmark countries that abandoned the use of reserve requirements more or less entirely relatively early on include Belgium (mid-1970s), Norway (1987) and Sweden (1990). In Norway, for example, both primary reserves (that is, cash-reserve requirements) and secondary reserves (compulsory bond holdings by banks and insurance companies) had been used since the 1960s. From 1971 only the primary reserve requirements were used in Norway, but they were altered often and by much.

Minimum reserve requirements did play a role (at least formally) as liquidity-management instrument until the late 1990s in the Netherlands and, to some extent, in Austria, Finland, and Ireland. However, the only benchmark country where they played a significant role for active liquidity management in the late 1990s was Greece (until its entry into the EMU), where the instrument was deemed necessary to retain control over the liquidity supply in the face of large capital inflows. This parallels earlier experiences in, for instance, Portugal, other emerging market economies, and the present situation in China, where since the 1990s the PBC still relies heavily on reserve requirements to manage liquidity.

China has lowered reserve requirement ratios since the 1980s and 1990s (see Figure 1), but there is no clear-cut trend, and an indication of the PBC's continued reliance on this instrument type is its introduction of a differentiated reserve requirement system in 2004 to increase flexibility and precision. However, minimum reserve requirements do not bite as a monetary policy tool unless a properly functioning pricing mechanism in the money market gives banks an incentive *not* to put their liquidity into reserves (i.e. keep them close to the minimum requirement). This is not the case in China, where 1998-2004 the reserve holdings

of the banks have more or less consistently been in excess of 5 percent beyond the required ratio (see Figure 2).

INSERT FIGURE 1

INSERT FIGURE 2

4.2. The increasing role of market instruments in central-bank operations

Three main types of market instruments predominate: short-term securities, repurchase operations, and swaps. The prevalence in our benchmark countries and in China of these main instrument types is examined in the present sub-section.

Effective open-market operations to some extent presuppose an existing market to operate in. Thus, central banks have typically, at some point or another, come to favor the creation of markets, and have often stimulated and supported their development. This holds for interbank deposit markets as well as for short-term securities markets.

The absence of an efficient interbank market is bad news for the central bank to the extent that banks then may rely on central-bank facilities to gain access to liquidity even when other banks are very liquid, creating a situation of excess liquidity in the banking system and poorer monetary transmission.[8] For monetary policy to bite, banks' *marginal* liquidity needs must be settled with the central bank. Hence there is a need for central banks to create adequate instruments to drain liquidity and to stimulate the formation of markets for alternative short-term assets. Instead, traditionally in our benchmark countries, specific credit quotas to individual banks were used to atone for this problem. In the general climate of decontrol in the mid-1980s, however, it seems ultimately to have been widely accepted that stimulating the emergence of efficient markets was a more constructive path to pursue. Examples are the establishment of efficient day-to-day interbank markets in Belgium and

Sweden (in both cases around 1985–88), which were more or less anticipated effects of changes in the layout of monetary-policy operating procedures (BNB, 1985; Kneeshaw and Van den Bergh, 1989). More generally, the emergence of a markka money market was stimulated by the Bank of Finland's decision to leave the forward exchange market to the devices of the banks themselves (around 1980). Parallels exist in, for example, Denmark and Portugal (see Danmarks Nationalbank *Monetary Review*, August 1996; and Pinto, 1996).

The emergence of short-term securities markets adds a dimension to liquidity management for central banks. In practice, cash operations in short-term securities by central banks are relatively rare, even where the size of these markets is sufficiently large to make such operations feasible (see Borio, 1997; BIS, 2003). One reason is that other types of operations are more flexible. Other reasons which have carried some weight in several benchmark countries are the wish to avoid potential conflict with other public-policy objectives (notably public-debt management, for example in Denmark and Portugal, and tax policy), and the wish to avoid circumvention of limits on central-bank lending to the government.[9]

To avoid conflicts of interest and to increase the effectiveness of monetary policy, it has been relatively common for central banks in the benchmark countries to issue their own securities (central-bank CDs) in the primary market in order to absorb liquidity from the banking system. In some cases, this has been one of the main strategies of the central bank. Countries where the issue of central-bank paper has played an important role during shorter or longer periods include Finland, Ireland, the Netherlands and Portugal among the EMU countries, and Denmark and Sweden among non-EMU countries. This is currently the main type of market operation in China (see Section 3.3).

Even in the absence of outright transactions in securities, the existence of a liquid securities segment in the money market is often argued to facilitate the central bank's

operations by providing collateral to repurchase agreements and similar collateralized transactions. To the extent that it does so, the varying degrees to which short-term securities markets have emerged in the benchmark countries imply correspondingly varying possibilities for the respective central banks to exploit the flexibility and other advantages of repurchase agreements and similar instruments. During the course of the 1990s, repurchase transactions were adopted as a main liquidity-management instrument in Denmark (as from 1992), Sweden (1994) and Switzerland (1998), in Austria (1995), Finland (mid-1990s), the Netherlands (refers to 'special loans') and then, from the time of its inception in 1999, in the whole Eurosystem (see Table 5).

INSERT TABLE 5

In China, the PBC started cash and repurchase operations in government bonds in 1998. Temporary reverse repos in bonds were conducted in 2002 but operations then seized because of inadequate supply of bonds. The question here is not so much the original maturities of the assets, but the absence of a market at all. Government issues are all that exists in the medium-to-long-term segments; the short end is dominated by PBC bills, but there is scant demand for either, because the pricing mechanism does not work.[10] The general conclusion in terms of the PBC's open market operations is that debt markets in the mid-2000s are too shallow for effective buy-sellback or sell-buyback operations.

Some benchmark countries without liquid short-term markets have relied on foreign-exchange operations (particularly swaps) for liquidity management. The pre-eminence of swaps over spot or regular forward-exchange operations simply reflects the greater importance of swaps in the interbank market. Swaps are the major instrument by which banks cover their forward foreign-exchange commitments to customers (See Hooyman, 1994).

Benchmark countries where FX swaps have played a significant role for liquidity management by the central bank and/or by the banking system as a whole include Austria, the Netherlands and Denmark. In Switzerland, USD-CHF swaps were the principal market operation of the National Bank during the period between the early 1980s and the late 1990s.[11]

A Chinese foreign exchange swap market was established in 1980 after the first restrictions on foreign exchange transactions were removed in 1979, and an interbank foreign exchange market introduced in 1994 as the dual exchange rate system was abolished (Yang et al., 2004). In the mid-2000s, these markets do not play any substantial role for the central bank's liquidity management with the domestic banking sector (BIS, 2003; Ping, 2005).

5. Changes in central-bank operating procedures: main drivers

Because financial market regulations were partly designed as monetary policy instruments, the deregulation process is in itself sufficient reason for reform of the operational framework of central banks: as some policy instruments are taken away, others must replace them. Beyond this, the literature and the central banks' own accounts offer five main reasons for the more or less universal reform of central bank operating procedures in industrial countries in the 1980s and 1990s (see, e.g., Mehran et al., 1996, and Forssbæck and Oxelheim, 2003, for elaborations).

First, monetary-policy instruments were changed in several benchmark countries in order to adapt the operational frameworks of the respective monetary authorities to new regimes and/or new targets for monetary (and exchange-rate) policy.

Second, the financial deepening of the benchmark economies occurred more or less entirely outside the central banks' balance sheets, and therefore reduced the share of the financial system over which monetary authorities could exert direct control. The result was an

increasing need for *indirect* ways to exercise control over the non-monetary components of the money supply (price-oriented as opposed to quantity-oriented instruments).

A *third* factor relates both to the expansion and diversification of financial markets domestically and to the increasing international integration of financial markets. Greater interest-rate flexibility and narrowing differentials between rates of return in different currencies gave rise to the need for instruments whereby liquidity (and thereby interest rates) could be managed more *flexibly* in time and in magnitude, and with a greater measure of *accuracy* than that offered by, say, discounting, interest-rate controls, and lending ceilings.

Fourthly, the increasing importance of *expectations* in a world of free financial markets favored the adoption of instruments better suited for *signaling* the central bank's monetary policy stance.

A *fifth* broad category of reasons relates to the wish more generally (on the part of monetary authorities) to stimulate money-market activity and improve monetary-policy transmission, and to achieve a clearer separation of monetary policy implementation from government-debt management, and from other social-policy goals (favoring certain sectors in the economy by granting access to cheap credit, etc.) which were auxiliary reasons for the imposition of financial-market regulations. Because financial regulations were often of a multiple-purpose variety, and because the central bank was typically responsible for the implementation of the regulation policy, the distinction between monetary policy and other 'types' of policy had previously not always been very clear-cut.

Do these five reasons apply to the Chinese situation today? The simple answer is maybe, but not generally. The objectives of monetary policy remain manifold and not necessarily compatible, and the priorities between different goals are unclear − in other words, no major regime shift has taken place; the financial system − as we have seen − is still underdeveloped, and financial intermediation beyond the explicit or implicit control of the

central bank is limited; as a result of the former, and due to the remaining financial repression, the role of expectations is still limited. Reasons three and five, however, deserve closer attention in the Chinese case. There *is* a need for more flexible and accurate instruments, and it *is* a declared objective of the PBC to stimulate money market activity and improve monetary policy transmission. The reason is − simply, and in parallel with several of the benchmark countries − that monetary policy presently is ineffective (see Ping, 2005, among others). The reason it does not work, however, is not obviously the same. In the next session, we analyze sources of fluctuations in the liquidity of the Chinese banking system and the effects of Chinese monetary policy against the backdrop of the experience of our benchmark countries.

6. The bite of Open Market Operations (OMO) in China in an international context

In order to analyze the bite of Chinese OMOs we construct the following stylized balance sheets for the PBC and a number of benchmark central banks based on the actual published balance sheets:[1]

$$NFA + NLG + NLB + ONA = CIC + BR, \qquad (1)$$

where *NFA* = net foreign assets; *NLG* = net lending to the government; *NLB* = net lending to banks; *ONA* = other net assets; *CIC* = currency in circulation; and *BR* = bank reserves.

The sum of the components on each side of the equality is the monetary base. Differencing gives the possibility to analyze the contributions of the various components to net changes in the liquidity of the banking system. The changes in the components are scaled by the average size of the monetary base over each sample period (in the case of the moving

[1] The framework for analysis is due to Borio (1997); for a more detailed analysis of the balance sheet of the benchmark central banks, see Forssbæck and Oxelheim (2003).

average time series for China in Figures 3 and 4, over the 12 preceding months), in order to allow for comparisons over time and across countries.

Define the percentage *autonomous liquidity position* at time $t+i$,

$$ALP_{t+i} = (\Delta NFA + \Delta NLG + \Delta ONA - \Delta CIC)_{t+i} \Big/ \frac{1}{T}\sum_{j=0}^{T-1}(CIC + BR)_{t-j} \ , \qquad (2)$$

where T is the number of observations in each sample period (the number of observations over which the scaling factor is averaged), and i can be zero, positive, or negative, depending on the temporal relationship between a particular observation and the scaling factor.

Correspondingly, let the percentage *net policy position* at time $t+i$ be defined by

$$NPP_{t+i} = \Delta NLB_{t+i} \Big/ \frac{1}{T}\sum_{j=0}^{T-1}(CIC + BR)_{t-j} \ . \qquad (3)$$

The sum of the contribution of the autonomous factors and the policy position constitutes *net liquidity provision*, which – in accordance with identity (1) – must then also be defined as

$$NLP_{t+i} = \Delta BR_{t+i} \Big/ \frac{1}{T}\sum_{j=0}^{T-1}(CIC + BR)_{t-j} \ . \qquad (4)$$

The policy position, finally, can then be broken down into its various components (such as standing facilities, various types of open market operations, etc.) depending on the degree of detail provided by the respective central bank's balance sheets. When it comes to the PBC, this degree is not very high, and it basically just separates between claims on (different types of) financial institutions on the asset side and debt securities issuance on the liabilities side.

For some of the European countries' central banks, OMOs in the form of foreign exchange operations were not identifiable. The distinction between standing facilities and OMOs is therefore not entirely watertight in our sample, and it is even likely that the OMOs component is somewhat underestimated as a general rule.

Table 6 provides a summary, where the autonomous and policy positions and their various components are averaged over the relevant time periods.

INSERT TABLE 6

Figures 3—5 give a more detailed picture of the Chinese case. Figure 3, first, shows that net liquidity follows the autonomous determinants of liquidity infusion closely, whereas policy generally works in the opposite direction. Both the autonomous position and the policy position became markedly larger as of the beginning of 2003, still resulting in a rather sharp increase in net liquidity.

INSERT FIGURE 3

Of the autonomous factors (Figure 4), changes in cash and in net lending to the government appear relatively stationary, whereas the net foreign assets contribution describes a clear and rather sharp upward trend. The by far most volatile contribution, however (in contrast to the benchmark countries), is that of changes in other net assets. The hike in this series after the end of 2003 is wholly due to a relatively large increase in the balance sheet item 'other assets' between November and December 2003, and – particularly – to the disappearance from the liabilities side of *all* 'savings deposits of non-financial institutions'

between December 2003 and January 2004. No explanation is offered in the PBC's quarterly monetary policy reports for the relevant time period(s), so the interpretation remains open.

INSERT FIGURE 4

Figure 5 (A and B), finally, illustrates an attempt to trace the development over time in the use of different types of monetary policy instruments. In the figure the solid lines show the variability (measured as 12-month rolling standard deviations) over four years (2001—2004) of the PBC's policy position due, respectively, to standing facilities (panel A) and open market operations (panel B). As a comparison the figure also reproduces the average corresponding variabilities for the included benchmark countries at three points/periods in time (cf. Table 6, rows 8 and 9). A 'corridor' of the cross-country variation in these variabilities is also added. We can see that the trend-wise development over time for the benchmark countries clearly shows the gradual demise of standing facilities and corresponding rise of OMOs as main policy instrument over the 20-odd year period. The considerably shorter time for which the Chinese development is studied shows no similar clear trend. Instead, the variability in the policy position of the PBC is comparatively low and stable, and at the lower standard deviation bound as compared to the benchmark countries. A tentative conclusion would be that OMOs in China are not yet very extensive in international comparison, possibly reflecting the relatively underdeveloped state of financial markets in general and money markets in particular. A further conclusion of the overall analysis – one that would tend to support previous analyses (e.g., Green, 2005; Ping, 2004) – would be that the policy actions of the PBC in general are comparatively small and ineffectual relative to the effects of autonomous determinants of liquidity and to the overall size of the monetary base. Any conclusion, however, about the form and relative importance of the PBC's various

operations has to be delivered with the caveat of what was mentioned above, viz. that the separation between different kinds of operations in the PBC's balance sheets is not very transparent. A more general remark about the direction and speed of the development is that in the perspective of a 20-year development in Europe, it is of course not surprising that China still has some way to go.

INSERT FIGURE 5

7. Effectiveness of monetary policy operations - discussion

In this section we present some conclusions regarding the effectiveness of monetary policy operations during the financial transition period of our benchmark countries and discuss the relevance of these in terms of Chinese monetary policy options. *First*, autonomous factors are often the most important sources of liquidity fluctuations in the domestic money market. The central bank is frequently 'unsuccessful' in offsetting these influences other than imperfectly. In short, this means that the job of the central bank is primarily to forecast and offset factors outside its direct control that influence the domestic market, and only then (marginally) to 'steer' the money market.[12] The two most important autonomous sources of fluctuation in money-market liquidity (and thus the major factors that the central banks have to counter in their policies) are net foreign assets and net lending to the government. The net-foreign-assets portion of the autonomous position should—all else equal—be more variable in countries with far-reaching exchange-rate commitments, where the central bank has been active in the foreign-exchange market or in other ways made more extensive use of foreign-exchange reserves to uphold that commitment. However, Forssbæck and Oxelheim (2003) instead find that net foreign assets are a more important source of liquidity fluctuation in 'weak-currency'

countries (regardless of exchange-rate regime), and a less important one in 'hard-currency' countries.

This leads up to the *second* main conclusion: non-credible policy (for example exchange rate) commitments lead to ineffective central bank operations. If the central bank's target variables are influenced to a great extent by factors beyond its control, then not only is the effectiveness in achieving the desired policy goals impeded, but so also is its choice among the range of instruments at its disposal, as well as its capacity to influence the overall structure of the money market.

Thus, *thirdly*, autonomous factors affect central bank instruments and money market structure. On a more general level, this emphasizes the need for *consistency* in the policy pursued.

The consistency issue links the third conclusion to the *fourth* one. Economic independence of central banks leads to more effective central bank operations and vice versa. If economic independence of the central bank can be approximated by the influence on liquidity fluctuations over the central bank's balance sheet of net lending to the government, then the central bank's ability to effectively anchor money market interest rates and to stabilize the exchange rate, is increasingly impeded the more it has to counter liquidity fluctuations resulting from the obligation to fulfill other public-policy goals (such as government financing).

Below, we use these four conclusions in order to structure a discussion about the roots of the present ineffectiveness of Chinese monetary policy.

Based on conclusion 1 above: Large capital inflows and resulting build-up of foreign exchange reserves has been the most important source of liquidity in the early 2000s. Base money growth has trend wise increased from 2% to 17% between 1998 and 2003 (Goldstein, 2004). Foreign exchange reserves as percent of GDP has increased from 15% the first quarter

2001 to 40% at the end of 2004 (Goldstein, 2004). The PBC's operations during the last few years have largely been geared toward offsetting these undesired money-supply effects of capital inflows.

Estimations by Green (2005) show that the PBC's open market operations are almost perfectly correlated with capital inflows. Yet, Green reports that the operations are able to sterilize less than 50% of the effect of these inflows on the money supply. According to the estimates, between the middle of 2004 and early 2005, foreign exchange inflows added cumulatively to the money base in the order of RMB 100 bn per *month*, indicating an annual growth rate of around 70%. The asymmetry of capital controls giving a bias toward net capital inflows has exacerbated this problem.

Based on conclusions 2 and 4 above: The multiple, and often incompatible, goals of monetary policy − fixed dollar exchange rate, inflation, growth, employment, financial stability, etc. − are evidently a major problem for Chinese monetary policy. The very recent problems of the PBC to make monetary policy 'bite' are clearly influenced by the exchange rate regime, for example. Given the level of financial risk in the economy, the possibility of misleading interest rate levels, and other factors, it is not obvious that the currency is/was under-valued (for discussions, see, e.g., Eichengreen, 2005; Goldstein, 2004; Prasad et al., 2005); whether it was or not, however, it would appear as though a revaluation came to be expected for at least two years before the modest revaluation was finally implemented in July 2005. This partially explains the troubles of the PBC of conducting a monetary policy which was much too expansionary for domestic conditions, but still not expansionary enough to keep capital inflows at bay (the share of non-foreign direct investment inflows also significantly increased during this period; see BIS, 2003, 2005; Prasad and Wei, 2005; van der Linden, 2005). In short, the exchange rate goal was non-credible, which worsened the conditions for monetary policy operations. More generally, an exchange rate stability goal

increasingly undermines monetary policy autonomy as capital controls erode, which – by definition – compromises some or several of the other goals. The internal deregulation of the financial sector and the full market access of foreign banks (implying the possibility of interest arbitrage between foreign and the domestic Chinese markets) will further erode the remaining restrictions on the capital account (Liu, 2005).

Not just non-credible exchange rate goals disturb monetary policy; another example may be the attempts to simultaneously achieve the goals to safeguard financial stability and prop up employment in the publically owned manufacturing sector. Large state-owned enterprises are squeezed by remaining commitment to production planning, and are unable to compete with the private sector. State-owned banks are forced to finance state-owned enterprises (SOE) with successively new loans (which are frequently not repaid), in order to avoid large-scale unemployment and social unrest. Remaining political influence over the banking sector, lack of incentives for adequate credit assessment and monitoring (because of the seemingly unlimited willingness of the government to bail out banks) and lack of legal enforcement of financial contracts, as well as general property-rights and transparency issues, lead to massive mis-allocation of savings (2/3 of savings are channeled to the public sector through the banking system) and to the accumulation of non-performing assets on banks' balance sheets (estimates of non-performing loans range from 20 to 50% of the largest banks' total loan portfolios, or 30 to 80 % of GDP; see van der Linden, 2005).

Based on conclusion 3 above: At least two more reasons for excess liquidity in the Chinese banking system exist. First, the financial system in general is underdeveloped and unable to absorb the large monetary overhang in the economy; i.e., there is a lack of alternative investments, especially for short-term funds (see money market structure, above). Second, there exist *de facto* lending restrictions. There is much to suggest that more or less official administrative control of the quantity and direction of banks' lending is currently the

most important instrument at the PBC's disposal to contain money supply growth. At the same time, these practices are counter-productive to the longer-term interests of the PBC to improve the transmission mechanism to the extent that they leave banks awash with liquidity.

8. Concluding remarks

Up to the late 1970s and early 1980s, money markets (as well as the financial sectors in general) in our benchmark countries were typically underdeveloped and highly regulated. Since then, politics – through financial sector deregulation, government debt policy, and de-politicization of monetary policy – has been one of the main determinants of money-market development.

We argue that financial deregulation as an 'active' or 'passive' response of politicians to developments beyond their control, the need to find new and more flexible sources of government borrowing, and the need to establish a forum for effective monetary-policy implementation—go a long way to explain the significant cross-country differences among our benchmark countries in terms of money-market size and structure, as well as the timing and direction of various policy decisions and outcomes. A main observation is also that a policy decision, once taken, cannot easily be reversed, as the development over time may be characterized as a continuous interplay between policy decisions and market outcomes. The development process thus becomes highly *path dependent*, and largely reflects political *ad-hoc* decisions, which are often, in themselves, responses to market developments. There are also considerable potential spill-over effects from other policy areas. Therefore, a gradualist approach and 'controlled' financial deregulation like in China is difficult, because − from the point of view of the policy purpose − financial market regulations are complementary (doing away with one undermines the purpose of another), and − more generally − 'controlled' and 'deregulated' are in some sense mutually exclusive.

Chinese monetary policy is largely characterized by this type of spillover effects, and is full of inherent inconsistencies and conflicts of interest, giving rise to a large degree of discretionary, *ad hoc* policy measures. As a consequence, China will only be able to partially emulate other countries' experiences, but outcomes will reflect exogenous factors affecting its policy and policy responses to those factors, if anything is to be learned from the benchmark countries we study here, where central banks have often had a decisive influence on money-market development.

Some benchmark countries have changed the basic monetary-policy regime one or more times during the period studied (Finland, Greece, Portugal and Sweden are the most obvious examples, excepting the changeover to EMU). Changes in monetary-policy conditions and operations are correspondingly big in these countries. Among the benchmark countries that essentially stuck to the same policy regime (exchange-rate targets, mostly) throughout the 1980–1998 period, some saw less dramatic changes in the indicators used to analyze monetary policy (Austria, Belgium), while in others, the changes were of average magnitude (Netherlands) or comparatively big (Denmark).

Did in our benchmark countries comparatively radical structural changes in the domestic money market (in terms of innovation, market growth and regulatory changes) correspond also to bigger changes in monetary policy? There seems to be *some* connection between, for instance, the size of short-term securities markets and the magnitude of change in monetary-policy operations: the limited market growth in Austria and Switzerland, for instance, goes together with small changes in central-bank operations; equally, the larger markets of Finland and Sweden fit with more and/or bigger changes in the operative aspects of monetary policy. On the other hand, the limited size of the short-term securities market in the Netherlands, for instance, does not seem to preclude significant changes in policy procedures. It must also be added that the gradually increased reliance on the part of central

banks on indirect, market-based instruments for policy making is more or less a universal phenomenon. Moreover, and as already stressed, the development of markets in which to conduct open-market operations has in many cases been explicitly or implicitly supported by monetary authorities.

A few lessons (or policy recommendations) for China from the transition period of our benchmark countries directly related to the money market could be the following.

- A general recommendation and a clear lesson from the European experience is to focus objectives as well as operative targets of monetary policy.
- One part of this increased focus could be increased flexibility of the exchange rate: As explained above, whether the RMB is under-valued or not, the rigid exchange rate (the *de facto* effects of the modest revaluation and move to a 'managed float' in July 2005 remain to be seen) has undermined attempts so far to foment broader and deeper financial markets, not least a functioning money market, and is directly counter-productive to the effectiveness of the PBC's market operations. With the so-far rigid currency regime, the absence of adjustment to capital movements on the exchange rate effectively implies that adjustments are being 'passed on' to a domestic financial system which is not developed enough to handle it. A more flexible exchange rate would also stimulate the development of the foreign-exchange market, including a market for FX derivatives linked to the domestic money market.
- The banks' continued lack of *de facto* independence as economic entities is distorting the financial intermediation process as well as the PBC's own capacity for effectively implementing policy. For market operations to work, there must be a market of independent market participants acting on the basis of market criteria – i.e., the PBC must not be able to use its political clout to force the banks to respond to various measures when in fact they have no economic incentive to do so. The privatization of

the state-owned banks may work in the right direction to the extent the Government just retain a small stake in the banks and by that reduces its influence.

- Creation of short-to-medium term securities market based on *bank* liabilities, such as a CD market; this could help banks clean up their balance sheets (instead of piling up liquidity or channeling it into speculative fixed investments), as well as providing alternative investments to drain the money market of excess liquidity.
- Create a viable treasury bill (short-term government debt) market; with the present continued weakness of the banking system, it is unlikely that a CD market could function as a benchmark segment for the short end of the debt market.

It should be noted that many of these solutions rely on more broad-based institutional reforms to work properly. China is still largely a 'commando economy', which − whether that command is explicitly or implicitly exerted − eliminates the proper incentives to reach market clearing outcomes in whatever market. Imbalances will persist without a firmer and more unconditional commitment to market principles.

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Table 1. Financial-market regulation in China 2005 and in the European benchmark countries 1980

Countries with various forms of controls

	Interest-rate restrictions	*Specific credit controls*[a]	*Overall credit growth limit*	*Investment obligations*	*Issuing restrictions*	*Branching restrictions*
China	•	•[b]	•[b]	•[c]	•	•
Austria	•	•	•	•	•	•
Belgium	•	•	–	•	•	•
Denmark	•	•[e]	•[b]	–	•	–
Finland	•	•[b]	–	–	•	•
Greece	•	•	•	•	•	•
Ireland	•	•	•	n.a.	n.a.	n.a.
Netherlands	–	•	•	–	•	•[d]
Norway	•	•	•	•	•	•
Portugal	•	•	•	•	•	•
Sweden	•	•	–	•	•	•
Switzerland	•	–	–	–	•	•

n.a.: Information not available.

Notes: [a] Quotas or ceilings imposed on individual banks or groups of banks/financial institutions, and similar detailed credit controls. [b] Quotas have formally been scrapped but the central bank exerts/exterted discretionary control of credit growth through 'guidelines' or 'moral suasion'. [c] State-owned commercial banks were relieved from directed credit in 1994 by the creation of three so-called 'policy banks'; the latter, and possibly the former as well, remain subject to this type of regulation. [d] No real restrictions, but a separation in a legal sense of different types of credit institution was made, and the rules on prudential supervision varied accordingly. [e] Abolished in 1980.

Sources: Edey and Hviding (1995); OECD Financial Market Trends (various); Hope and Hu (2006); Oxelheim (1990, 1996); Ping and Xiaopu (2003); Vihriälä (1997); Wyplosz (2001); PBC (2005) and other various national sources.

Table 2. Money-market innovations, money-market development in different benchmark countries

Year of introduction or year of deregulation of market; for some instruments, the indication refers to the year of establishment of a viable market in that instrument.

	Interbank deposit market/ '-IBOR' reference rate	*Treasury bills or treasury notes*	*CDs/ central-bank CDs*	*Commercial paper*	*Single-currency interest-rate futures*	*Single-currency interest-rate swaps and/or options*	*Foreign-exchange or currency swaps*[a]	*Repo market/ repos adopted by central bank*
China	1996/1996	1981 (1986)[b]	2004[c]/2003	2004[c]	. .	. .	1980	c. 1991/1998[d]
Austria	n.a. /1989	1987[e]	. . /1995	. .	1993	1994	C. 1990	. . /1995[f]
Belgium	1988/1988	1990[g]	1992/ . .	1990	1988	1991	1980s	n.a./n.a.[h]
Denmark	1970s[i]/1988	1975	. ./1992	. .	1988	1988	1970s	1993/1992
Finland	1986/1987	1991	1982/1987	1986	1992	1988	1980s	. . /1991
Greece	n.a./1994	1985	. . / . .	. .	[j]	[j]	[j]	C. 1995/1997
Ireland	1978/ 1993	1960s[k]	n.a./ . .	1989	1989	1989	C. 1990	1997/1997
Netherlands	n.a./1986	1970s	1986/1994	1986	1987	1994[l]	1976	n.a./n.a.
Norway	1993/1993[m]	1985	1985/ . .	1985	1993	n.a.	1970s	1996/. .[n]
Portugal	1989[o]/1992	1985[p]	1993/1994	1994	1996	1993	1987	n.a./c. 1992
Sweden	1985/1987	1982	1980/1992	1983	1984	1985	n.a.	1980s/1984
Switzerland	n.a./n.a.	1981	. ./. .	. .	1990	1994[l]	1970s[q]	1998/1998

. . Not applicable / a viable market in the instrument does not exist.

n.a.: Data not available.

Notes: [a] Refers to 'interbank swaps': central banks have been using swaplike instruments for considerably longer—the German Bundesbank, e.g., since 1958 (Hooyman, 1994). [b] Limited trading first permitted in 1986. [c] Refers to 'short-term financing bills'. [d] Operations have since largely seized due to inadequate supply of underlying instruments. [e] Refers to the year from which government debt is issued by competitive bidding. [f] The OeNB started to make advances against securities in 1985, but began to make systematic use of repos only in 1995. [g] Refers to the year from which treasury certificates are issued by competitive bidding. [h] The BNB has been conducting advances against collateral for a long time. [i] The market remained inactive until the reform of the monetary-policy operating framework in 1992. [j] A limited derivatives market exists since 1994. [k] Exchequer bills. [l] Options. [m] Refers to the domestic reference rate NIDR; an 'international' reference rate (NIBOR) also exists. [n] Norges Bank conducted 'temporary bond purchases' between 1984 and 1986. [o] Refers to the year of liberalization of the interbank market. [p] Treasury bills; so-called 'negotiable cash bonds' were introduced in 1983. [q] The SNB has been using swaps for monetary-policy-making purposes for a longer time.

Sources: Alworth and Borio (1993); BIS (1999); Batten et al. (1990); De Broeck et al. (1998); de Teran (2004); Euromoney country surveys (various); Green (2005); Holbik (1991); Hope and Hu (2006); Khoury (1990); Kullberg (1991); Norges Bank (1995); OECD Financial Market Trends (various); Oxelheim (1996); Ping and Xiaopu (2003); Pinto (1996); Yang et al. (2004); various national sources.

Table 3. Short-term securities markets in benchmark countries 1985 and 1995 and in China 2004.

Outstanding amounts (% of GDP at year-end)

	1985					1995				
	T-bills	CDs	CB CDs	CP / other	**Total**	T-bills	CDs	CB CDs	CP / other	**Total**
AT	3.7				**3.7**	4.7				**4.7**
BE	24.0				**24.0**	17.8	1.9		2.3	**22.0**
DK	4.7	3.9			**8.6**	15.9	3.3			**19.2**
FI					**0**	6.9	12.9	4.9	1.1	**25.8**
GR	24.3				**24.3**	31.1				**31.3**
IE	1.5[a]	2.1[b]			**3.6**	2.3[a]	4.9[b]		3.6	**10.8**
NL	4.0				**4.0**	2.0	0.7	1.7	0.5	**4.9**
NO	1.6	0.1		1.1	**2.8**	4.4	1.9		4.1	**10.4**
PT	0.8				**0.8**	8.9	0.2		2.3	**11.4**
SE	11.5	1.2			**12.7**	12.2	0.5	4.6	8.2	**25.5**
CH					**0**	4.0				**4.0**
Avg (sd)					**7.7 (9.0)**					**15.5 (9.7)**
	2004									
CN (est.)	**< 1.0**		**6.7**	**n.a.**	**7 − 8**					

n.a.: Data not available.

Notes: [a] Exchequer bills. [b] Saving certificates.

Sources: Austrian Federal Ministry of Finance (BMF) and Austrian Federal Financing Agency (BFA); Ministère des Finances Belge, Administration de la Trésorerie; Danmarks Nationalbank; Suomen Pankki; Bank of Greece; Central Bank of Ireland; De Nederlandsche Bank; Norges Bank; Banco de Portugal; Sveriges Riksbank; Banque Nationale Suisse; People's Bank of China; BIS, Quarterly Review: International Banking and Financial Market Developments (various); Green (2005); GDP figures from IMF International Financial Statistics and Deutsche Bank.

Table 4. Reserve requirements in benchmark countries 1970, 1980 and 1990 and in China 1990 and 2004

	Late 1990s			*2004*		
	RRIF	*Max.*	*Diff.*	*RRIF*	*Max.*	*Diff.*
China	•	13.0	–	•	7.5	•

	1970s		*Late 1980s*[a]			*Late 1990s*[b]		
	RRIF	*Max.*	*RRIF*	*Max.*	*Diff.*	*RRIF*	*Max.*	*Diff.*
Austria	•	10.5[c]	•	9.0[d]	•	•	5.0	•
Belgium	•	6.2[e]	–	–	–	–	–	–
Denmark	•[j]	3.0	–	–	–	–	–	–
Finland	•	3.2[f]	•	7.8	–	•	2.0	•
Greece	•	n.a.	•	n.a.	n.a.	•	12.0	–
Ireland	•	13.0[f]	•	10.0[g]	–	•	3.0	–
Netherlands	•	7.0[h]	•	var.	•	•	var.	•
Norway	•	5.5[l]	–	–	–	–	–	–
Portugal	•	15.0[e]	•	17.0[i]	–	•	2.0	–
Sweden	•	5.0[e]	•	4.0	–	–[k]	–	–
Switzerland	•	n.a.	•	2.5	•	•	2.5	–
Eurosystem[m]	. .	. .	. .	. .	. .	•	2.0	–

RRIF: Reserve requirements in force

• Yes

– No

Max.: Maximum reserve ratio applied

Diff.: Different ratios for different types of liabilities/deposits (this information was unavailable for a majority of countries for the 1970s; therefore the column has been left out for that decade).

. . Not applicable

N.a. Not available

Notes: [a] 1988 unless otherwise indicated; [b] Individual country ratios of EMU countries refer to ratios applied before the launch of the Eurosystem; [c] 1972; [d] 1990; [e] 1974; [f] 1979; [g] 1986; [h] 1973; [i] 1989; [j] Temporarily in force 1975–76; [k] The required reserve ratio was set to zero in April 1994, and has not been used as a policy instrument since; [l] 1976; [m] since 1999.

Sources: Bank of Japan (1995); BIS (1997b); Borio (1997); Central-bank bulletins (various); ECB (1998); Holbik (1973); Kneeshaw and Van den Bergh (1989); OECD Financial Market Trends (various); Pinto (1996) and PBC (2005).

Table 5. Targets and main open-market operations in benchmark countries before the launch of EMU and in China 2005

Country	*Orientation / main target*	*Main operating variable*	*Key instrument*	*Collateral for repurchase transactions*	*Other open-market operations*
China	Exchange rate stability (official target), low inflation, growth, financial stability, employment, *ad hoc* political objectives	Overnight money market rate, money supply	Reserve requirement, rediscount rate, issuance of central bank bills, political clout	Government bonds	Issuance of central bank bills
Austria	Exchange rate	Overnight rate	Repurchase agreements	Government and private securities	Foreign-exchange swaps
Belgium	Exchange rate	1–3-month rate	Repurchase agreements	Trade bills; government securities	Interbank operations; foreign-exchange swaps; etc.
Denmark	Exchange rate	1–14-day rate	Secured loans (repo-equiv.); central-bank CDs	Government securities; mortgage bonds	Foreign-exchange operations
Finland	Inflation (formally) / exchange rate	1–3-month rate	Repurchase agreements	T-bills; government bonds; central-bank and bank CDs; AMCA notes[a]	Outright money-market operations; sales of central-bank CDs; foreign-exchange operations
Greece	Inflation / exchange rate	M3/M4N growth rate and total credit expansion are 'tentative' targets	Deposit tender operations	Government securities	Reverse repos; foreign-exchange swaps
Ireland	Inflation / exchange rate	1-month rate	Repurchase agreements	Government securities	Foreign-exchange swaps
Netherlands	Exchange rate	1-month rate	'Special loans' (repo-equiv.)	Government and private securities	Sales of short-term paper; foreign-exchange swaps; etc.
Norway	Exchange rate	1-week rate	Deposits and loans	T-bills and government bonds	Foreign-exchange operations; repos; T-bill issues
Portugal	Inflation / exchange rate	Overnight rate	Repurchase agreements	Government securities[b]	Central-bank CDs; TIM[c]
Sweden	Inflation	Overnight rate	Repos/reverse repos	Government and mortgage securities	Interbank operations
Switzerland	Reserves ('M0')	Giro deposits	Foreign-exchange swaps	Treasury bills	Repurchase agreements; transfer of government deposits

Notes: [a] Notes issued by the Asset Management Company Arsenal. [b] Private securities introduced in May, 1998, as a step in preparation for stage 3 of EMU. [c] Títulos de Invervenção Monetária (Monetary Intervention Bills).
Sources: Banco de Portugal, Economic Bulletin 1 and 2 1998, and Annual Report 1998; Bank of Finland Bulletin 9/1998; Bank of Greece, Monetary Policy Interim Report November 1998 and March 1999, and Annual Report 1998; Borio (1997); Central Bank of Ireland, Annual Report 1998; Danmarks Nationalbank, Monetary Review 2, 1999; Norges Bank, Penger & Kreditt 1998/4, and Annual Reports 1997 and 1998; BIS (2003); PBC, China Monetary Policy Report (various quarters 2002-2005); Ping (2004); Ping and Xiaopu (2003).

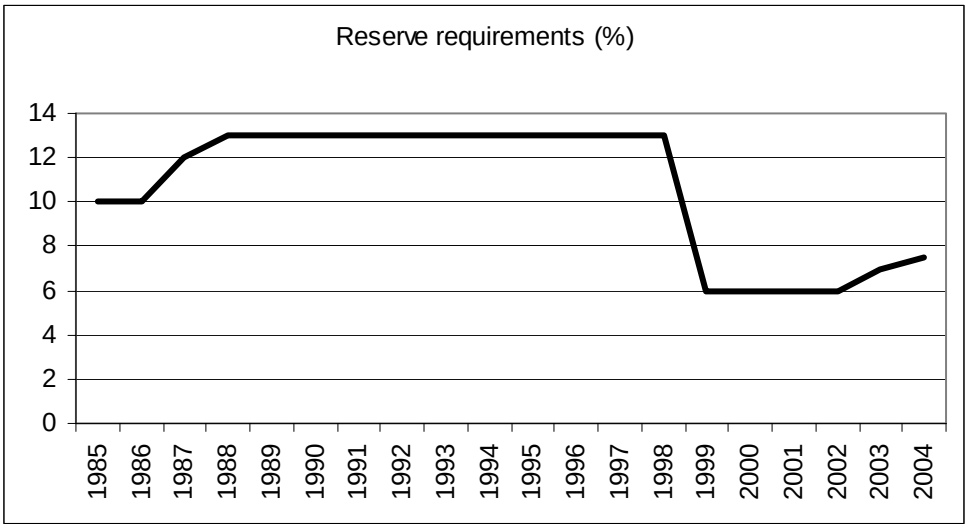
Table 6. Sources of liquidity fluctuations, summary
(average positions over the respective time periods[a] as percentage of the monetary base; variability of positions shown as standard deviations in parentheses; for the benchmark countries, the variability in the positions is shown as the *average* of country-by-country standard deviations).

	China 2000-2004	7 benchmark countries, early 1980s	8 benchmark countries, late 1980s	10 benchmark countries, late 1990s
1. Autonomous position (= 4 + 5 + 6 - 7)	1.76 (4.57)	0.56 (10.11)	0.05 (8.69)	-1.01 (10.24)
2. Policy position (= 8 + 9)	-0.63 (2.33)	-0.38 (10.12)	0.75 (8.00)	0.85 (11.49)
3. Net liquidity (= 1 + 2)	1.13 (4.21)	0.18 (4.34)	0.79 (5.78)	-0.16 (7.64)
Breakdown of autonomous position				
4. ΔNet foreign assets	1.37 (1.69)	0.84 (5.59)	0.26 (6.43)	0.16 (7.95)
5. ΔNet lending to government	-0.14 (2.12)	1.01 (8.94)	0.21 (7.72)	-0.57 (7.16)
6. ΔOther net assets	0.78 (3.52)	-0.88 (3.49)	-0.27 (2.80)	-0.57 (2.48)
7. ΔCurrency in circulation	0.24 (3.92)	0.39 (2.07)	0.15 (1.88)	0.02 (2.10)
Breakdown of policy position				
8. Standing facilities	-0.18 (1.90)	-0.31 (10.99)	0.37 (5.16)	-0.03 (1.26)
9. Open market operations	-0.44 (1.39)	-0.06 (1.04)	0.28 (4.73)	0.73 (10.86)

Note: a) The following periods apply:
China: Jan. 2000 – Dec. 2004 (monthly data).
7 benchmark countries, early 1980s: Belgium, Jan. 7, 1980–June 30, 1980 (weekly data); Denmark, Jan. 1979–Dec. 1980 (monthly data); Finland, Jan. 8, 1980–May 30, 1980 (weekly data); Ireland, Dec. 1979–Feb. 1981 (monthly data); Netherlands, Jan. 5, 1981–May 25, 1981 (weekly data); Portugal, Jan. 1980–Dec. 1981 (monthly data); Sweden, Jan. 1980–Oct. 1981 (monthly data).
8 benchmark countries, late 1980s: Austria, Oct. 31, 1989–Jan. 31, 1990 (weekly data); Belgium, Jan. 2, 1989–June 26, 1989 (weekly data); Denmark, Jan. 1988–Dec. 1989 (monthly data); Finland, Jan. 6, 1989–May 31, 1989 (weekly data); Ireland, Dec. 1988– Jun. 1990 (monthly data); Netherlands, Oct. 2, 1989–Feb. 26, 1990 (weekly data); Norway, Portugal, Jan. 1988—Dec. 1989 (monthly data); Sweden, Jan. 1987—Oct. 1988 (monthly data).
10 benchmark countries, late 1990s: Austria, Jan. 7, 1998–May 31, 1998 (weekly data); Belgium, Jan. 5, 1998–May 29, 1998 (weekly data); Denmark, Dec. 1997—Nov. 1998 (monthly data); Finland, Dec. 31, 1997–May 29, 1998 (weekly data); Ireland, Dec. 1997—Dec. 1998 (monthly data); Netherlands, week 1, 1998–week 25, 1998 (weekly data); Norway, Dec. 1997—Dec. 1998 (monthly data); Portugal, Jul. 1996—Jun. 1998 (monthly data); Sweden, Dec. 31, 1998–May 31, 1999 (weekly data); Switzerland, Sept. 30, 1999–Apr. 10, 1999 (weekly data).

Sources: The figures are calculated on the basis of data from the respective central banks' balance sheets, mostly taken from annual and/or interim reports; in some cases obtained as spreadsheet documents directly from the central bank.

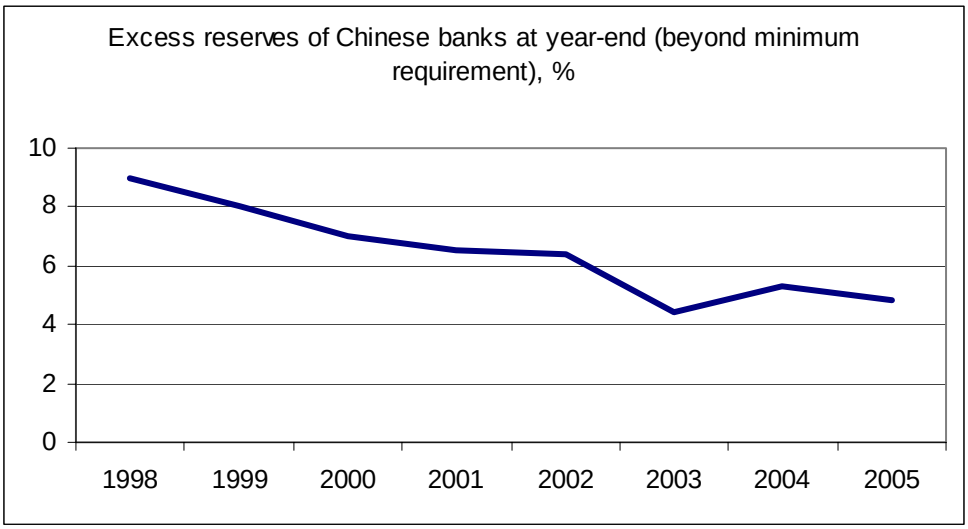
Figure 1. Minimum reserve requirements in China, 1985−2004



Source: People's Bank of China.

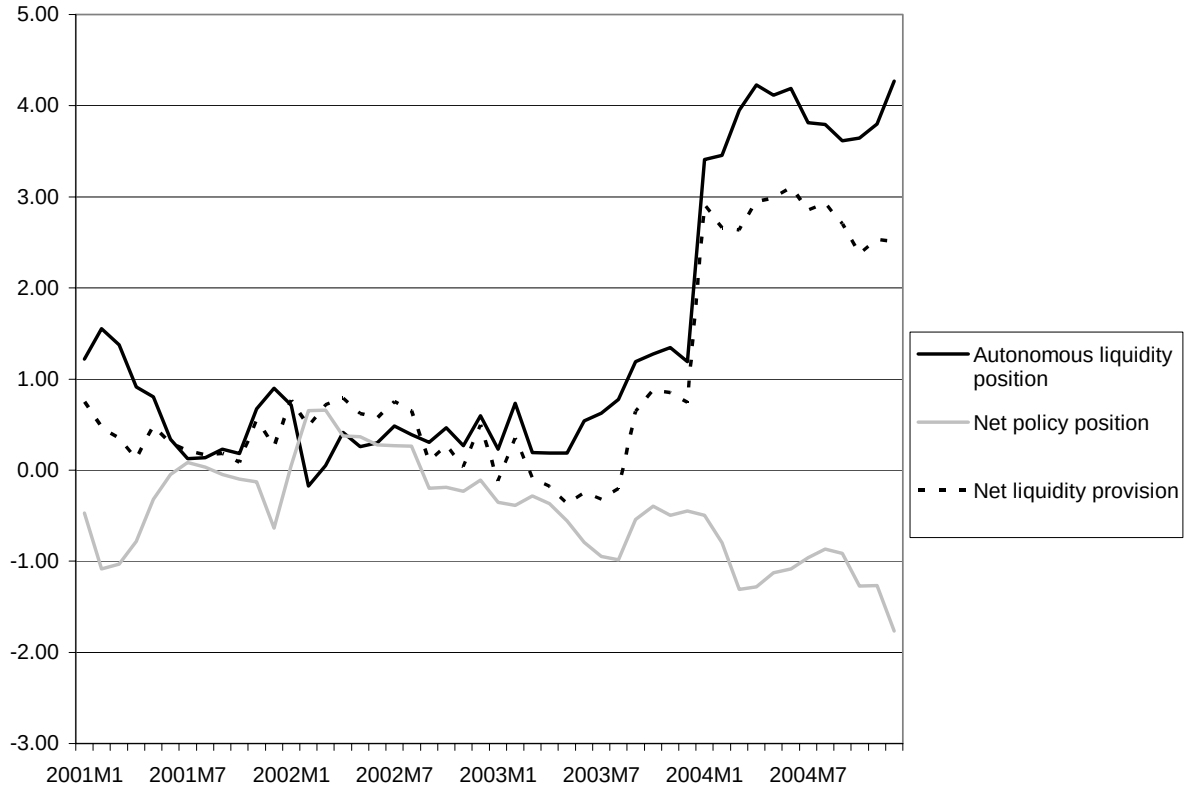
Figure 2. Excess reserve ratio of Chinese banks, 1998—2005

(average at year-end)



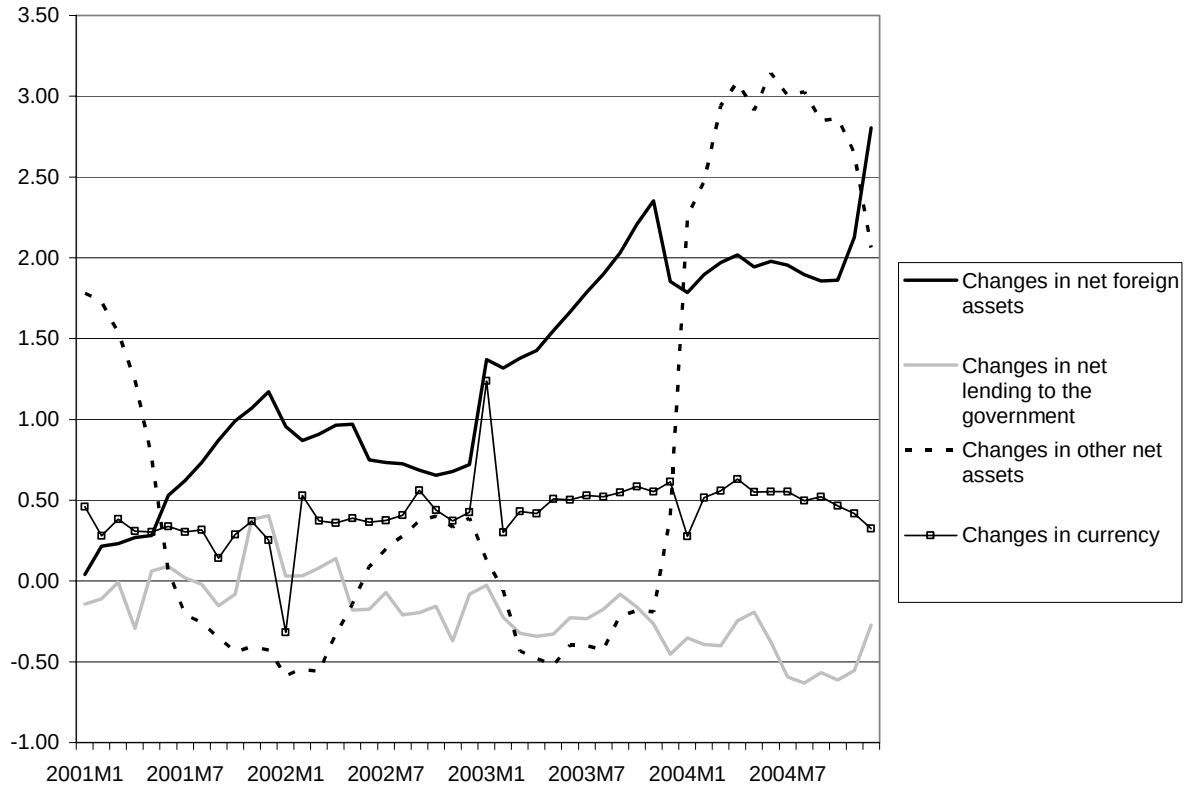
Source: People's Bank of China.

Figure 3. Autonomous position, policy position, and net liquidity provision in China
(in per cent of monetary base; 12 month moving averages, 2001—2004)



Source: calculations based on data from the People's Bank of China.

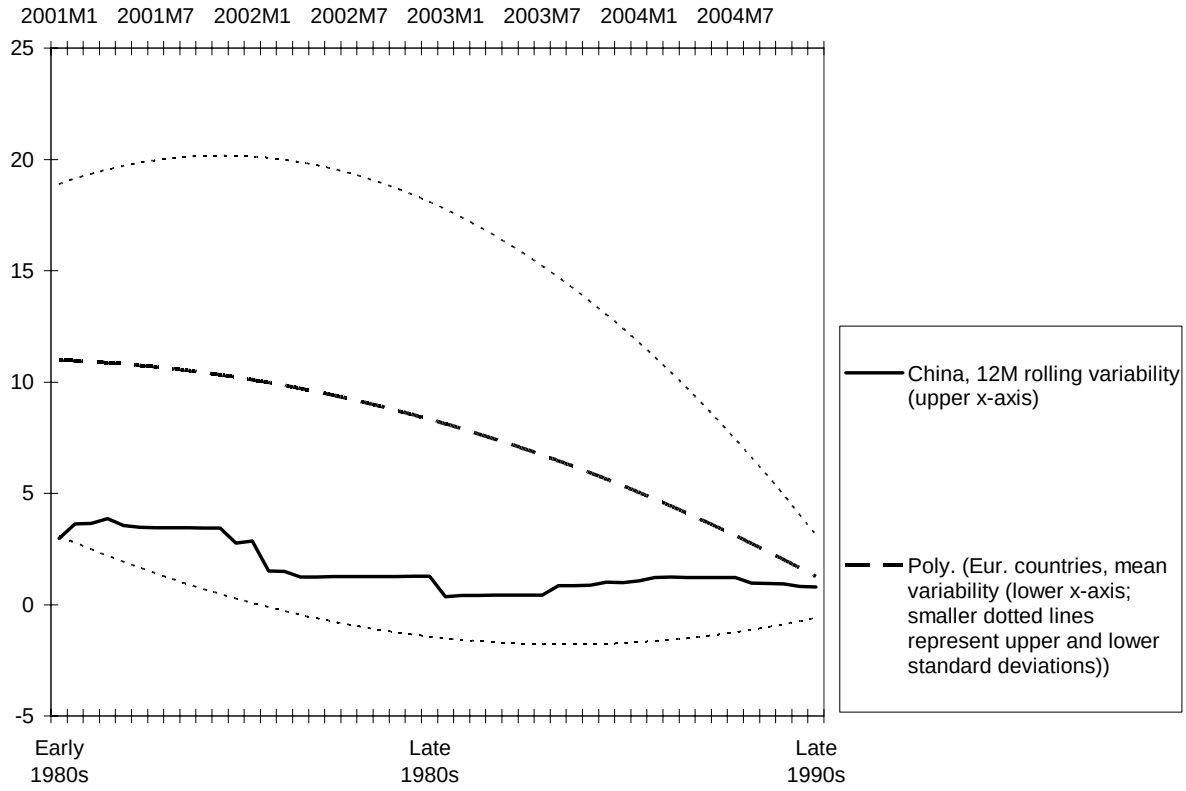
Figure 4: Contributions to autonomous liquidity position in China
(in per cent of monetary base; 12 month moving averages, 2001—2004)



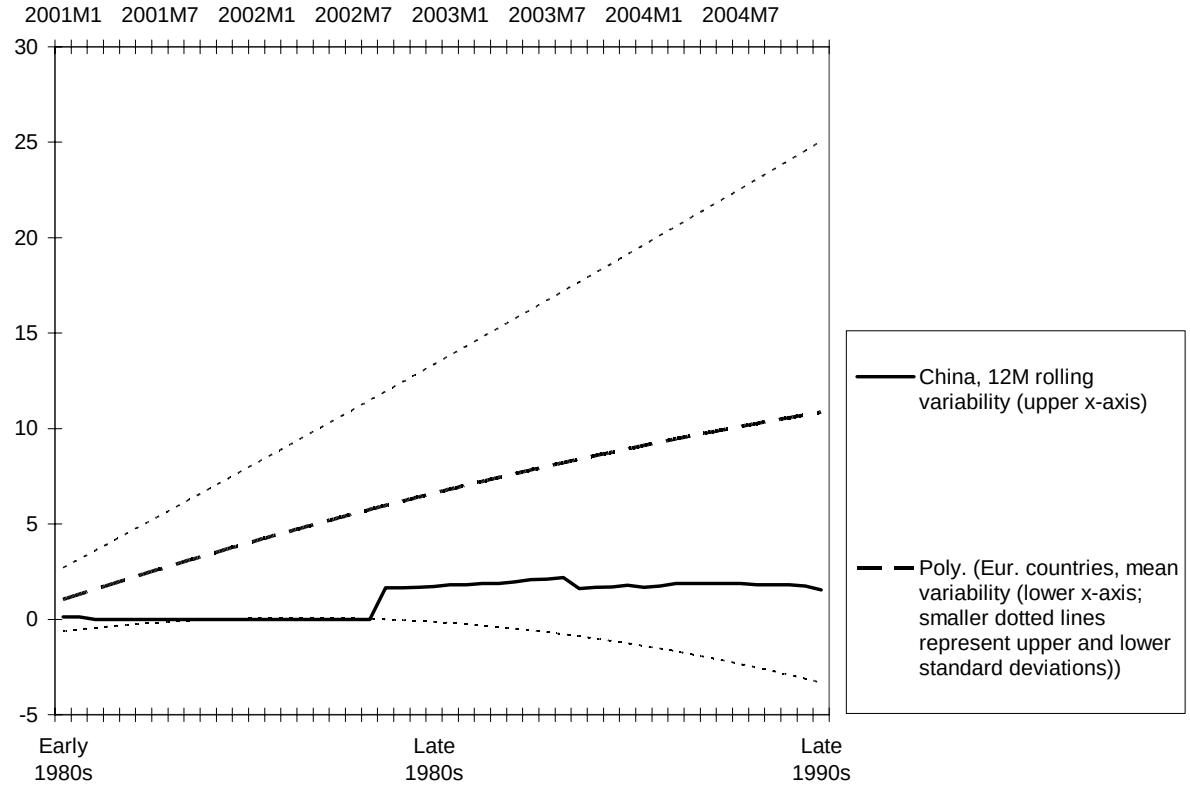
Source: calculations based on data from the People's Bank of China.

Figure 5: Variability of policy position in China and the benchmark countries
China (12 month rolling standard deviations, 2001—2004, upper x-axis) and benchmark countries (3 time periods between early 1980s and late 1990s, lower x-axis)

Panel A. Variability in policy position due to standing facilities



Panel B. Variability in policy position due to open market operations



Sources: See Table 6

Notes

[1] Existing cross-country comparisons of monetary policy operating procedures − e.g., Kneeshaw and Van den Bergh (1989), Batten *et al*. (1990), Bernanke and Mishkin (1992), Kasman (1992), Goodhart and Viñals (1994), Hooyman (1994), Bisignano (1996), Borio (1997), BIS (2001), Kopcke (2002), Forssbæck and Oxelheim (2006) − consistently indicate that changes in central banks' operative frameworks are causes as well as effects of changes in the functioning and structure of the financial system.

[2] The benchmark countries are the following European countries: Austria, Belgium, Denmark, Finland, Greece, Ireland, the Netherlands Norway, Portugal, Sweden and Switzerland.

[3] For a more comprehensive account of the process of financial deregulation in the Nordic countries, see Oxelheim (1996); a survey of this process for a large number of countries, including many emerging-market countries, is provided in Williamson and Mahar (1998); beyond these, the best sources for specifics on deregulation in particular countries are usually publications from the central bank of the country in question. OECD's *Financial Market Trends* is also a useful source.

[4] Retail interest rates were controlled in practice in Austria at least until the mid-1990s via gentlemen's agreements between banks; credit has also traditionally been heavily subsidized: in the early 1990s almost half of all credit extended to industry, though formally free from regulations, was subsidized (see Pech, 1994).

[5] See, for example, the survey in OECD (1989). It can be noted that the pendulum with regard to branching restrictions and market-entry regulation currently tends to swing back somewhat toward increasing regulation, the establishment of firewalls between different types of business within multiple-business financial institutions, etc. This might be interpreted as an expression of a requirement of minimum regulation to avoid moral hazard and/or adverse-selection problems and to ensure public confidence in the financial system.

[6] *Banker* (1993). Also see the *Economist* (1992) and Warner (1993) for short background articles on the deregulation and privatization of Portuguese banks.

[7] General references for this sub-section not cited elsewhere include BIS (1986, 1997a), and Aspetsberger (1996).

[8] In Switzerland, for instance, the underdeveloped domestic money market, the unaccommodative attitude of the National Bank with regard to reserve imbalances (resulting from its long-standing reserves target—now abolished—) and the comparatively high cost of Lombard (overdraft) facilities led Swiss banks to hold reserves substantially in excess of those required under reserve requirements (Kasman, 1992).

[9] These problems are particularly relevant in emerging stages of money-market development; see, e.g., Mehran *et al*. (1996); Kneeshaw and Van den Bergh (1989).

[10] As an illustration, Green (2005) reports that the mispricing by the market of a long-term government bond issue made underwriters unable to resell the bonds without incurring major losses, forcing the PBC to step in and buy a large portion of the issue − effectively amounting to central bank financing of the government.

[11] By 1987, the National Bank's holdings of currency swap contracts amounted to approx. half of its foreign-currency assets, which in turn amounted (together with gold) to almost 90% of its total assets. Roughly that situation remained until 1998, when the National Bank began to broaden its arsenal of instruments (Banque Nationale Suisse, *Bulletin Trimestriel* 4, December, 1999). Also see Zurlinden (1996).

[12] One potentially complicating factor here is that if we believe that the central bank's policy measures can in and of themselves give rise to 'innovations', we have an endogeneity problem of the 'exogenous' factors: the central bank influences these factors *indirectly* through its own actions.